Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in this application.

The following amendments do not constitute an admission regarding the patentability of the amended subject matter and should not be so construed. Amendments to the claims were made for purposes of more clearly stating the claimed subject matter and do not add new matter or alter the scope of the claims.

Listing of Claims:

1. (Currently Amended) A method of mapping a set of *n*-dimensional input patterns to an m-dimensional space using locally defined neural networks, comprising the steps of:

   (a) creating a set of locally defined neural networks trained according to a mapping of a subset of the *n*-dimensional input patterns into an *m*-dimensional output space; and

   (b) mapping additional n-dimensional input patterns using the locally defined neural networks.

2. (Currently Amended) The method of claim 1, wherein step (a) comprises the steps of:

   (i) selecting k patterns from the [[set]] subset of *n*-dimensional input patterns, $\{\mathbf{x}_i, i= 1, 2, ... k, \mathbf{x}_i \in R^n\}$;

   (ii) mapping the patterns $\{\mathbf{x}_i\}$ into an *m*-dimensional space ($\mathbf{x}_i \dashrightarrow \mathbf{y}_i$, i = 1, 2, ... k, $\mathbf{y}_i \in R^m$), to form a training set $T= \{(\mathbf{x}_i, \mathbf{y}_i), i=1, 2, ... k\}$;

   (iii) determining *c* *n*-dimensional reference points, $\{\mathbf{c}_i; i = 1, 2, ... c, \mathbf{c}_i \in R^n\}$;

   (iv) partitioning *T* into *c* disjoint clusters C_j based on a distance function *d*, $\{C_j = \{(\mathbf{x}_i, \mathbf{y}_i): d(\mathbf{x}_i, \mathbf{y}_i) \leq d(\mathbf{x}_i, \mathbf{c}_k)$ for all $k \neq j$; $j = 1, 2, ... c$; $i = 1, 2, ... k\}$; and

(v) training c independent local networks $\{Net_i^L, i = 1, 2, ... c\}$, with [[the]] respective pattern subsets C_i.

3. (Original) The method of claim 2, wherein said step (iii) is performed using a clustering methodology.

4. (Currently Amended) The method of claim 2, wherein said step (b) comprises the steps of:

(i) for an additional n-dimensional input pattern $x \in R^n$, determining the distance to each reference point in $\{\mathbf{c}_i\}$;

(ii) identifying [[the]] a reference point $\mathbf{c}_j$ closest to the input pattern $\mathbf{x}$; and

(iii) mapping $\mathbf{x} \dashrightarrow \mathbf{y}$, $\mathbf{y} \in R^m$, using the local neural network Net_i^L associated with the reference point $\mathbf{c}_j$ identified in step (ii).

5. (Currently Amended) The method of claim 1, wherein step (a) comprises the steps of:

(i) selecting k patterns of the set of n-dimensional input patterns, $\{\mathbf{x}_i, i = 1, 2, ... k, \mathbf{x}_i \in R^n\}$;

(ii) mapping the patterns $\{\mathbf{x}_i\}$ into an m-dimensional space, $(\mathbf{x}_i \dashrightarrow \mathbf{y}_i, i = 1, 2, ... k, \mathbf{y}_i \in R^m)$, to form a training set $T = \{(\mathbf{x}_i, \mathbf{y}_i), i = 1, 2, ... k\}$;

(iii) determining c m-dimensional reference points, $\{\mathbf{c}_i, i = 1, 2, ... c, \mathbf{c}_i \in R^m\}$

(iv) partitioning T into c disjoint clusters C_j based on a distance function d, $\{C_j = \{(\mathbf{x}_i, \mathbf{y}_i): d(\mathbf{y}_i, \mathbf{c}_j) \leq d(\mathbf{y}_i, \mathbf{c}_k)$ for all $k \neq j$; $j = 1, 2, ... c$; $i = 1, 2, ... k)\}$;

(v) training c independent local networks $\{Net_i^L, i = 1, 2, ... c\}$, with [[the]] respective pattern subsets C_i; and

(vi) training a global network Net^G using all the patterns in *T*.

6. (Original) The method of claim 5, wherein said step (iii) is performed using a clustering methodology.

7. (Currently amended) The method of claim 5, wherein step (b) comprises the steps of:

(i) for an additional *n*-dimensional pattern $\mathbf{x} \in R^n$, mapping $\mathbf{x} \dashrightarrow \mathbf{y}'$, $\mathbf{y}' \in R^m$, using Net^G;

(ii) determining the distance of $\mathbf{y}'$ to each reference point in $\{\mathbf{c}_i\}$;

(iii) identifying [[the]] a reference point $\mathbf{c}_j$ closest to $\mathbf{y}'$[[,]] ; and

(iv) mapping $\mathbf{x} \dashrightarrow \mathbf{y}$, $\mathbf{y} \in R^m$, using the local neural network Net_j^L associated with the reference point $\mathbf{c}_j$ identified in step (iii).

8. (Currently amended) The computer program product comprising a computer usable medium having computer readable program code means embodied in said medium for causing an application program to execute on a computer that maps a set of *n*-dimensional input patterns to an *m*-dimensional space using locally defined neural networks, said computer readable program code means comprising:

a first computer readable program code means for causing the computer to create a set of locally defined neural networks trained according to a mapping of a subset of the *n*-dimensional input patterns into an *m*-dimensional space; and

a second computer readable program code means for causing the computer to project additional *n*-dimensional patterns of the input set using the locally defined neural networks.

9. (Currently Amended) A computer program product of claim 8, wherein said first computer readable code means comprises:

(i) computer readable program code means for selecting k patterns from the [[set]] subset of *n*-dimensional input patterns, $\{\mathbf{x}_i, i = 1, 2, ... k, \mathbf{x}_i \in R^n\}$;

(ii) computer readable program code means for mapping the patterns $\{\mathbf{x}_i\}$ into an *m*-dimensional space ($\mathbf{x}_i \dashrightarrow \mathbf{y}_i, i = 1, 2, ... k, \mathbf{y}_i \in R^m$), to form a training set $T = \{(\mathbf{x}_i, \mathbf{y}_i), i=1, 2, ... k\}$;

(iii) computer readable program code means for determining *c* *n*-dimensional reference points, $\{\mathbf{c}_i; i = 1, 2, ... c, \mathbf{c}_i \in R^n\}$;

(iv) computer readable program code means for partitioning *T* into *c* disjoint clusters C_j based on a distance function *d*, $\{C_j = \{(\mathbf{x}_i, \mathbf{y}_i): d(\mathbf{x}_i, \mathbf{y}_i) \leq d(\mathbf{x}_i, \mathbf{c}_k)$ for all $k \neq j; j = 1, 2, ... c; i = 1, 2, ... k\}$; and

(v) computer readable program code means for training *c* independent local networks $\{Net_i^L, i = 1, 2, ... c\}$, with [[the]] respective pattern subsets C_i.

10. (Currently Amended) The computer program product of claim 9, wherein said first computer readable program code means uses a clustering methodology.

11. (Currently Amended) The computer program product of claim of claim 9, wherein said second computer readable code means comprises:

(i) for an additional *n*-dimensional input pattern $x \in R^n$, computer readable code means for determining the distance to each reference point in $\{\mathbf{c}_i\}$;

(ii) computer readable program code means for identifying [[the]] a reference point $\mathbf{c}_j$ closest to the input pattern **x**; and

(iii) computer readable program code means for mapping $\mathbf{x} \dashrightarrow \mathbf{y}$, $\mathbf{y} \in R^m$, using the local neural network Net_i^L associated with the reference point $\mathbf{c}_j$ identified in step (ii).

12. (Currently Amended) The computer program of claim 8, wherein said first computer readable program code means comprises:

(i) computer readable program code means for selecting *k* patterns of the set of *n*-dimensional input patterns, $\{\mathbf{x}_i, i = 1, 2, \ldots k, \mathbf{x}_i \in R^n\}$;

(ii) computer readable program code means for mapping the patterns $\{\mathbf{x}_i\}$ into an *m*-dimensional space, $(\mathbf{x}_i \dashrightarrow \mathbf{y}_i, i = 1, 2, \ldots k, \mathbf{y}_i \in R^m)$, to form a training set $T = \{(\mathbf{x}_i, \mathbf{y}_i), i = 1, 2, \ldots k\}$;

(iii) computer readable program code means for determining *c* *m*-dimensional reference points, $\{\mathbf{c}_i, i = 1, 2, \ldots c, \mathbf{c}_i \in R^m\}$

(iv) computer readable program code means for partitioning *T* into *c* disjoint clusters C_j based on a distance function *d*, $\{C_j = \{(\mathbf{x}_i, \mathbf{y}_i): d(\mathbf{y}_i, \mathbf{c}_j) \leq d(\mathbf{y}_i, \mathbf{c}_k)$ for all $k \neq j; j = 1, 2, \ldots c; i = 1, 2, \ldots k)\}$;

(v) computer readable program code means for training *c* independent local networks $\{Net_i^L, i = 1, 2, \ldots c\}$, with [[the]] respective pattern subsets C_i; and

(vi) computer readable program code means for training a global network Net^G using all the patterns in *T*.

13. (Currently Amended) The computer program product of claim 12, wherein said <u>first</u> computer readable program code means uses a clustering methodology.

14. (Currently amended) The computer program product of claim 12, wherein said second computer readable program code means comprises:

(i) for an additional *n*-dimensional pattern $\mathbf{x} \in R^n$, computer readable program code means for mapping $\mathbf{x} \dashrightarrow \mathbf{y}', \mathbf{y}' \in R^m$, using Net^G;

(ii) computer readable program code means for determining the distance of **y'** to each reference point in $\{\mathbf{c}_i\}$;

(iii) computer readable program code means for identifying [[the]] a reference point $\mathbf{c}_j$ closest to **y'**[[,]] ; and

(iv) computer readable program code means for mapping $\mathbf{x} \dashrightarrow \mathbf{y}, \mathbf{y} \in R^m$, using the local neural network Net_j^L associated with the reference point $\mathbf{c}_j$ identified in step (iii).